

Supernumerary Chromosomes in the Domesticated Eri-Silkmoth, *Philosamia ricini* (Saturnidae: Lepidoptera)

K. B. Padhy and B. Nayak

Department of Zoology, Bonaigarh College, Sundergarh, Orissa, INDIA

Abstract. Supernumerary chromosomes were detected in spermatocytes of the domesticated silkmoth, *P. ricini*. The supernumeraries varied from one to four in number and occupied an extranuclear position. In cases of single supernumeraries in a cell, it passes to one pole during anaphase I. Where two supernumeraries were present they form a bivalent in metaphase I and pass to two different poles during the next anaphase. All supernumeraries are eliminated from the meiotic cell population forming "micronucleus-like bodies" during interphase. Their "parasitic" way of chromatin elimination is discussed.

Microchromosomes occurring as supernumerary elements in the karyotype of lepidopteran species have been reported by many workers (DeLesse, 1960; Bigger, 1977; Nayal, 1974, 1978). *Philosamia ricini* possess a haploid chromosome number ($n = 14$) in the germ line. While examining the chromosome preparations of the testes from a population of domesticated *P. ricini* from Orissa, it was observed that in addition to the normal 14 bivalents in the diplotene and metaphase I, about 4% of the primary spermatocytes revealed 1-4 minute chromosomes which are supernumerary elements. The spermatocytes possessing supernumeraries showed their number as 1, 2 or 4. When they were more than one in number, pairing could occur between two such supernumerary chromosomes. A third supernumerary, if present, remained an univalent. All supernumeraries observed appear to be negatively heteropycnotic in metaphase I and positively heteropycnotic in the interphase. Therefore, such elements must not have produced by precocious resolution of any of the bivalents into univalents, nor to breakage of the normal complements, since they occur along with the normal chromosome complement. They have been observed to occupy a position outside the metaphase plate (Fig. 1), similar to such elements described by DeLesse (1960). Furthermore, missegregation of supernumeraries were observed in anaphase I when they numbered more than one, and when one supernumerary occurred it passed unresolved to one pole only. At the telophase I and the interphase they occupied an extranuclear position, forming a micronucleus-like body. They may be eliminated during germ cell development, therefore, without



Fig. 1. First metaphase spermatocyte of *P. ricini* indicating 14 bivalents and the supernumerary chromosome bivalent placed in an extranuclear position (arrow).

playing any significant role in influencing the development of the organism.

Although the exact nature of such supernumeraries is not yet known, these elements may represent a case of chromatinic elimination through heterochromatinisation of specific segments of normal bivalents. White (1977) argues that the presence of supernumerary chromosomes in many natural populations of insects may be produced due to metabolic disorders induced by agriculture chemicals. Such an explanation is not apparent here, since the species is maintained under laboratory conditions. Rather their both heteropycnotic and possibly deleterious nature more probably permits their classification as a "deleterious parasite" as suggested by Ostergreen (1945).

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